Hydrology and Earth System Sciences Discussions

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Comment

Interactive comment on "High resolution reconstruction of monthly precipitation of Iberian Peninsula using circulation weather types" *by* N. Cortesi et al.

Anonymous Referee #1

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The manuscript is an interesting work about rainfall regime in the Iberian Peninsula (IP) and its links with atmospheric circulation. The main contribution of the manuscript is the use of a high density spatial database of monthly precipitation in the IP during the period 1948-2003. Results confirm conclusions obtained in previous works, at monthly and/or seasonal timescales. In my opinion the manuscript would improve if the authors consider the following questions: 1) How is possible to obtain the maps in Figure 3 using only 16 grid points (Figure 2)? 2) How do you group the 26 daily WTs into monthly WTs? Averaging? The 26 daily WTs are valid for monthly time-scale? A change in the time scale would alter the number of WTs? Please, explain in detail. 3) According the

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authors (page 6945, lines 11-12) 'multicollinearity does not reduce the predictive power of the model, i.e.: it only affects calculations regarding the independent variables and their coefficients'. I'm not agree. In fact, the multicollinearity makes difficult to diagnose the factors that are most important in specifying the predictand variable (von Storch and Zwiers, 1999). In addition, the sampling distributions of the estimated regression coefficients can become very broad, with the consequence that a regression equation may perform very badly when implemented on data independent of the training sample (Wilks, 1995). In general terms, the multicollinearity introduces redundant information and weakens the analysis. If you wish to avoid this problem, you must use the principal component analysis in characterizing the predictor variable (SLP field). At seasonal time-scale this procedure was followed by Muñoz-Díaz and Rodrigo (2006). 4) What are the columns A and B of Table 3? (page 6948 lines2-3). 5) Please, specify the explained variance of the model. It is a very intuitive parameter, which allows check the goodness of the model and study if it is necessary to enlarge the analysis, looking for other predictors to explain the behavior of the predictand. 6) Have you analyzed other factors in addition to SLP? In particular, for the Mediterranean fringe, where the model is weaker, it would be interesting to consider SST and soil moisture as predictor variables. A brief discussion on the possible role of these factors and the contribution of convective rainfall would be necessary to complete the study.

References Muñoz-Díaz D, Rodrigo FS. 2006. Seasonal rainfall variations in Spain (1912-2000) and their links to atmospheric circulation. Atmospheric Research 81: 94-110. Von Storch H, Zwiers FW. 1999. Statistical analysis in climate research. Cambridge University Press. Wilks DS. 1995. Statistical methods in the atmospheric sciences. Academic Press.

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